



Manufacturing Method and Apparatus of Phase Shift Mask Blank

This application is a divisional of co-pending U.S. application serial no. 09/952,445 filed December 12, 2001 (now U.S. 6,783,634 issued August 31, 2004. This application claims the Paris convention priority of Japanese patent application 2000-277354 filed on September 12, 2000, the entire disclosure of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

i) Field of the Invention

The present invention relates to a manufacturing method and apparatus of a phase shift mask blank which is suitable particularly for ArF or F₂ excimer laser.

ii) Description of the Related Art

In recent years, it has become clear that high resolution and depth of focus are two important properties required for photolithography but are in a contradictory relation with each other, and that a practical resolution cannot be enhanced using only a short wavelength laser and an exposure apparatus with a lens having a high numerical aperture ("NA"). (Monthly Semiconductor World 1990.12, Applied Physics Vol. 60, November, 1991, and the like).

In such a situation, phase shift lithography has been noted as the next-generation photolithography technique, and partially brought to practical use. Phase shift